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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/971,711	10/09/2001	Satoshi Sugaya	Q66406	4242

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EXAMINER	
JACKSON, ANDRE K	

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/971,711	SUGAYA ET AL.	
	Examiner	Art Unit	
	André K. Jackson	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

   Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bennewitz et al. in view of Li et al., Kampe et al., Tanino et al. and in further view of Möbius et al.

2. Regarding claim 14, Bennewitz et al. disclose an insulating substrate; and a lower electrode; wherein the lower electrode comprises a noble metal porous body (Column 5), the upper electrode includes a noble metal porous body (Column 6); one or both of the lower electrode; the moisture sensitive layer is porous and the upper electrode predominantly contains Pt (Columns 5-6). Bennewitz et al. do not disclose where the moisture sensitive layer and an upper electrode are successively formed on the insulating substrate; where the upper electrode is joined to the moisture sensitive layer and a portion of the insulating substrate and where a size of pores in the upper electrode is 0.5-20 μm; a size of pores in the lower electrode is 0.5-20 μm; a size of pores in the moisture sensitive layer is 0.05-0.2 μm; particles of ceramic are incorporated in an amount of 1-20 wt% into the upper electrode and particles of ceramic are incorporated in an amount of 1-20 wt% into the lower electrode. However, Li et al.

disclose in "Solid state humidity sensor" where the moisture sensitive layer and an upper electrode are successively formed on the insulating substrate and where the upper electrode is joined to the moisture sensitive layer (Figures 6,7). Therefore, it would have been obvious to modify Bennewitz to include this teaching since by adding this feature it would provide a good linearity between resistance and relative humidity and improved durability for long-term use at high-humidity environments. Kampe et al. disclose in "Method of producing a gas diffusion electrode" where the size of the pores in the electrode is 20 μm (Column 3). Therefore, to modify Bennewitz et al. to include where the size of the pores in the electrode is 20 μm is clearly within the purview of the skilled artisan since this modification would give a good opening percentage for calculations. The pore size of one electrode is given. It is clearly within the purview of the skilled artisan to provide both electrodes with this feature since this would give the instrument the ability to have moisture penetrate from the upper and lower electrode. Tanino et al. disclose in "Humidity sensing element" a moisture sensitive layer (10, film, Column 6), which matches the moisture sensitive layer of claim 14 and contains pores in the specified range 0.05-0.2 μm [0.01-3μm] (Column 3). Therefore, it would have been obvious to modify the moisture sensitive layer of Bennewitz et al. to include a pore size of 0.05-0.2 μm as taught by Tanino et al. since this modification would help to keep particulates from the

atmosphere from depositing onto the humidity-sensing parts. Möbius et al. disclose in "Method of producing fuel cells with solid electrolytes and ceramic oxide electrode layers" particles that are incorporated in an amount of 1-20 weight percentage on the electrode (Column 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Bennewitz et al. to include particles incorporated in an amount of 1-20 weight percentage on the electrode since this modification would give good resistance-humidity characteristics. The weight percentage of one electrode is given. It is clearly within the purview of the skilled artisan to provide both electrodes with this feature since this would give the instrument the ability to have moisture penetrate from the upper and lower electrode.

3. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bennewitz et al. in view of Li et al., Kampe et al., Tanino et al., Möbius et al. as applied to claim 14 above and in further view of Gokhfeld.

Regarding claim 15, neither Bennewitz et al. nor the previously applied art disclose where a heater is provided in the insulating substrate. However, Gokhfeld disclose in "Humidity sensor with differential thermal detection and method of sensing" a heater provided in the insulating substrate (Figure 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bennewitz et al. to include a heater provided in the insulating substrate.

By adding this feature the artisan would be able to heat and elevate the temperature of the apparatus to determine the temperature coefficient.

Regarding claim 16, neither Bennewitz et al. nor the previously applied art disclose where a temperature measurement resistor provided in the insulating substrate. However, Gokhfeld discloses where the temperature measurement resistor is provided in the insulating substrate (Figure 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Bennewitz et al. to include where the temperature measurement resistor is provided in the insulating substrate. By adding this arrangement would make the temperature measurement more precise.

Regarding claim 17, neither Bennewitz et al. nor the previously applied art disclose where the heater is located directly below the moisture sensitive layer. However, Gokhfeld discloses where the heater is located directly below the moisture sensitive layer (Figure 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bennewitz et al. to include where the heater is located directly below the moisture sensitive layer. By adding this feature the artisan would be able to heat and elevate the temperature of the apparatus to determine the temperature coefficient.

Regarding claim 18, neither Bennewitz et al. nor the previously applied art disclose where the temperature measurement resistor is

located directly below the moisture sensitive layer. However, Gokhfeld disclose where the temperature measurement resistor is located directly below the moisture sensitive layer (Figure 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Bennewitz et al. to include a temperature measurement resistor located directly below the moisture sensitive layer in order to measure the temperature instantaneously.

4. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bennewitz et al. in view of Li et al., Kampe et al., Tanino et al., and Möbius et al. as applied to claim 14 above and in further view of Sunano et al.

Regarding claim 19, neither Bennewitz et al. nor the previously applied art disclose measuring humidity in an atmosphere containing a very small amount of oxygen and containing a reducing gas. However, Sunano et al. disclose in "Gas sensor" where the sensor is adapted for measuring humidity in an atmosphere containing a reducing gas (Columns 1-2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Bennewitz et al. to include where the sensor is adapted for measuring humidity in an atmosphere containing a reducing gas. By adding this feature the user would be able to measure the moisture within the engine exhaust. To provide the apparatus of Bennewitz et al. with a very small amount of oxygen is well within the

purview of the skilled artisan since it is well known that the smaller amount of oxygen lowers the electrical resistance.

5. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bennewitz et al. in view of Li et al., Kampe et al., Tanino et al., and Möbius et al. as applied to claim 14 above and in further view of Reeds, Jr.

Regarding claim 20, neither Bennewitz et al. nor the previously applied art disclose where one or both of the lower electrode and the upper electrode predominantly contains Pt and further contains Rh. However, Reeds, Jr. disclose in "Hygrometer" which is directed to determining moisture, where one or both of the lower electrode and the upper electrode predominantly contains Pt and further contains Rh (Column 3, lines 34-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bennewitz et al. to include where one or both of the lower electrode and the upper electrode predominantly contains Pt and further contains Rh. By adding this feature the life of the instrument will increase.

Regarding claim 21, neither Bennewitz et al. nor the previously applied art disclose where each of the lower electrode and the upper electrode predominantly contains Pt and further contains Rh. However, Reeds, Jr. which is directed to determining moisture, where each of the lower electrode and the upper electrode predominantly contains Pt and

further contains Rh (Column 3, lines 34-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bennewitz et al. to include where each of the lower electrode and the upper electrode predominantly contains Pt and further contains Rh. By adding this feature the life of the instrument will increase.

Response to Arguments

6. Applicant's arguments with respect to claims 14-21 have been considered but are moot in view of the new grounds of rejection.

7. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory

period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to André K. Jackson whose telephone number is (571) 272-2196. The examiner can normally be reached on Mon.-Thurs. 7AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A.J.

July 9, 2004

HELEN KWOK
PRIMARY EXAMINER